METHOD FOR MOTION CLASSIFICATION USING SWITCHING LINEAR DYNAMIC SYSTEM MODELS

ABSTRACT OF THE DISCLOSURE

5   Portions of an input measurement sequence are classified into a plurality of regimes by associating each of a plurality of dynamic models with one a switching state such that a model is selected when its associated switching state is true. In a Viterbi-based method, a state transition record is determined, based on the input sequence. A switching state sequence is determined by backtracking through the

10   state transition record. Finally, portions of the input sequence are classified into different regimes, responsive to the switching state sequence. In a variational-based method, the switching state at a particular instance is also determined by a switching model. The dynamic model is then decoupled from the switching model. Parameters of the decoupled dynamic model are determined responsive to a

15   switching state probability estimate. A state of the decoupled dynamic model corresponding to a measurement at the particular instance is estimated, responsive to the input sequence. Parameters of the decoupled switching model are then determined responsive to the dynamic state estimate. A probability is estimated for each possible switching state of the decoupled switching model. A switching state

20   sequence is determined based on the estimated switching state probabilities. Finally, portions of the input sequence are classified into different regimes, responsive to the determined switching state sequence.